879

mmt environmental services, inc.

September 17, 1996

Mr. Craig Averman
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155-4194

Re: Revised test plan for MCES Metro plant

Dear Craig:

Enclosed is a copy of MMT Environmental Services, Inc. (MMT) test plan #10012 regarding source emission testing at the Metropolitan Wastewater Treatment Plant in St. Paul, Minnesota. This latest revision includes the changes discussed in your pre-test meeting of September 16, 1996.

If you have any questions or comments, please call me at 483-9595

Sincerely,

Robert A. Laska

enclosures

4610 N. Churchill St. • St. Paul, MN 55126-5892 • 612 / 483-9595 • FAX 612 / 483-2699

MMT TEST PLAN #10012
SOURCE EMISSION COMPLIANCE TESTS
FOR SEWAGE SLUDGE INCINERATORS
AT THE MCES METRO PLANT

Date Test Plan Written/Revised	MPCA Pre-Test Meeting Date	Scheduled Test Period
September 16, 1996	September 16, 1996 10:00 a.m.	September 18, 1996

PART I. GENERAL INFORMATION

1: Emission Facility: ..... Metropolitan Council / Environmental Services
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
Phone: (612) 222-8423 Fax: (612) 229-2183

2: Facility Contact Person: ..... James W. Brown, Principal Process Engineer
Metropolitan Waste Water Treatment Plant
2400 Childs Road
St. Paul, MN
Phone: (612) 772-7222

3: MPCA file/permit number: ..... Permit #879-90-OT-3

4: Reason For Test: ..... Retest requirement due to non-compliance status of source per 6/18/96 compliance demonstration test failure.

5: Source to be Tested: ..... Emission Point #3, Incinerator #7, see Figure 1.

6: Physical Location of Source: ..... Stationary sources located at:
Metropolitan Waste Water Treatment Plant
2400 Childs Road
St. Paul, MN

7: Testing Company: ..... MMT Environmental Services, Inc.
4610 N. Churchill Street, St. Paul, MN 55126-5892
Phone: (612) 483-9595 Fax: (612) 483-2699
Contact: Robert Laska

8: Test Plan Discussions: ..... Pre-test meeting

9: Out-of-State Compliance Test: ..... Not Applicable

PART II. TESTING REQUIREMENTS

1. Pollutants to be tested, applicable emission limits, and governing regulations:

Emission Point	Pollutant	Emission Limit	Applicable Rule or Regulation	Test Methods	Length of Test Run
#3 (I7)	TSP	1.3 lbs/dry ton of sludge charged	MN Rules 7011.1310 & 40 CFR 60 Subpart O	EPA 1-5 MN back catch	≥ 60 min.
	Opacity	20 % opacity	MN Rules 7011.1310 & 40 CFR 60 Subpart O	EPA 9	60 min.

2. Auxiliary Fuel Description and Sampling Requirements:

   Auxiliary fuel burned during the incinerator performance tests will be either natural gas or fuel oil as identified in the following table.

Emission Point	Test Program	Auxiliary Fuel	Comment
#3 (Incinerator #7)	TSP, CO, VE	Natural Gas	plus Scum

3. Fuel sampling and analysis (Applicable to solid and liquid fuels only): NOT REQUIRED.

PART III. OPERATING CONDITIONS

1. General operating parameters for each emission point to be tested:

   Note that the process equipment, pollution control equipment and all related equipment must be operated by the facilities regular operators using their normal operating procedures.

Emission Points #3	
	Process Equipment Description: Incinerators #7 is a BSP Envirotech multiple rotary hearth units which was installed circa 1983. The incinerator has 9 hearths with a combined area of 2362 square feet. Rated capacity 3.75 tons of dry sludge per hour. Natural gas will be used as an auxiliary fuel during the test period. The units are also equipped to use #2 fuel oil as needed.
	Process Rates and Operating Conditions during Test: Sludge feed rate ..... 2.5 - 3.0 dry ton/hr Natural gas consumption ..... 7,000 cu ft/hr
	Control Equipment Description: The incinerator unit is equipped with an afterburner, a pre-cooler, a venturi scrubber and a sub-cooler. Incinerators #7 also has a Quadcyclone ash collector installed upstream of the pre-cooler.
	Control Equipment Operating Parameters: Afterburner Operating temperature ..... 1200 °F Residence time ..... 2.5 sec. Gas oxygen content ..... 10% v/v Quadcyclone ash collector Pressure drop ..... 5 in WC Pre-cooler Water flow rate ..... 220 gpm Inlet gas temperature (Incinerators 5 & 6)..... 1175 °F Inlet gas temperature (Incinerators 7 - 10) ..... 460 °F Outlet gas temperature ..... 160 °F Venturi scrubber Water flow rate ..... 220 gpm Pressure drop ..... 30 in WC Inlet gas temperature ..... 160 °F Outlet gas temperature ..... 120 °F Sub-cooler Water flow rate ..... 1500 gpm Pressure drop ..... 4.0 in WC Inlet gas temperature ..... 120 °F Outlet gas temperature ..... 70 °F

2. Explanation of why the proposed test conditions are considered to be the worst case in accordance with Minnesota Rules part 7017.2025, subpart 2:

Emission Points	Rationale For Worst Case
#3	Maximum particulate emissions should occur at maximum sludge feed rates. The average incinerator sludge feed rate (dry tons per hour) during the **TSP test** performance must be greater than or equal to **90** percent of the incinerator's maximum average daily sludge feed rate for the four (4) week period surrounding the test performance. The four (4) week periods specified above must consist of the immediate three (3) weeks before and one (1) week after the test performance.

3. Definition of the normal range of process operating rates:

Emission Points	Normal Range of Process Operating Rates
#3	1.8 to 3.0 dry tons of sludge per hour

4. Description of how process and air pollution control equipment operation will be monitored:

Emission Points	Process Equipment Description	Description Of Process Monitoring During Test Period
#3	Sludge feed rate	Motion weight belts. Data recorded by plant computer.
	Fuel consumption	Gas or Oil meter. Data recorded by plant computer.

Emission Points	Control Equipment Description	Description Of Control Equipment Monitoring During Test Period
#3	Afterburner temperature	Thermocouple. Data recorded by plant computer.
	Afterburner residence time	Afterburner volume divided by exhaust gas volumetric flow rate measured during test period.
	Gas oxygen content	Yokogawa oxygen meter located near the breeching. Data recorded by plant computer.
	Scrubber water flow	Water flow meter - Data recorded by plant computer
	Scrubber temperature	Thermocouple. Data recorded by plant computer.
	Scrubber pressure drop	Differential pressure sensor. Data recorded by plant computer.

PART IV. TEST METHODS

1. Specific test plan. The following tests will be performed on the specified emission points:

Emission Points	Test Description	Test Methods
#3	Carbon Monoxide	EPA Method 10. Three (3) 60 minute test runs will be performed.
#3	Opacity	EPA Method 9. One (1) sixty-minute test run will be performed.
#3	TSP	EPA Methods 1 - 5 with Minnesota back catch. Three (3) 60 minute test runs will be performed.

2. General Test Methodology. The following is a general listing of test requirements:

   A: EPA Method 1 for the location of sampling ports and sampling points.
   A check for cyclonic flow must be done whenever there is a cyclonic type of device directly upstream of the sampling location. The check must be performed even if flow straightening vanes have been installed. If the sampling location does not meet the minimum requirements of EPA Method 1, then the testing firm must conduct flow pattern evaluation and testing according to the alternative procedures in part 2.5 of EPA Method 1. Flow pattern documentation is required. Previously documented flow pattern tests are acceptable providing that no changes have occurred that would affect the flow pattern.

   B: EPA Method 2 for velocity and volumetric flow rate determination. One (1) gas volumetric flow rate test must be performed concurrent with each pollutant emission test run.

   C: EPA Method 3 for gas composition analysis (CO_2 & O_2). One (1) integrated gas sample must be collected concurrent with each pollutant emission test run. Sample analysis must be performed using an orsat analyzer.

   D: EPA Method 4 for determination of moisture in the flue gases. One (1) gas moisture content test must be performed concurrent with each pollutant emission test run.

   E: EPA Method 5 as amended by Minn. Rules 7017.2060 and 7011.0725 for the determination of particulate matter emissions. Particulate analysis will include back catch condensable organic matter. Three (3) test runs are required and each run must represent a minimum sampling time of 60 minutes and a minimum sample volume of 32 dry standard cubic feet.

F: EPA Method 9 as amended in Minnesota Rule 7017.2060 for the determination of visible emissions. One (1) sixty-minute test is required. If pollutant testing is being performed, then the opacity test must be performed concurrent with one of the pollutant test runs.

Note: Atmospheric conditions may make it impossible to obtain valid opacity observations concurrent with a pollutant emission test. If such circumstances exist, the visible emission test will be rescheduled for a later time/date and will be performed at similar load conditions.

G: EPA Method 10 for determination of effluent carbon monoxide concentration. Three (3) test runs are required. Each test run will consist of one sixty (60) minute integrated bag sample.

3. Reference to any compliance document, federal regulation, or Minnesota rule or statute requiring use of specific methods or procedures, shall be stated in this section. **NONE**

4. Proposed alternative/equivalent test methods: **NONE**

5. Non-reference test method: For each proposed non-reference test method, include a statement of the detection limit and the degree of accuracy of that method at the expected emission rate and under the conditions of the performance test. **NOT APPLICABLE**

NOTE: Sampling times and rates must be increased if necessary to ensure that the detection limit for each pollutant is below the applicable emission limit, using the equation in Minnesota Rules Part 7017.2045, Subpart 6.

PART V . CEMS RELATIVE ACCURACY TEST

Testing of continuous emission monitoring systems is **not** included in this test program.

PART VI. OTHER

For each process unit to be tested the following are specified:

1. Pollutant(s) emissions must be reported in same terms as the emission limit(s). Particulate matter (TSP) mass emission rates will be reported as pounds per hour and pounds per dry ton of sludge charged. Opacity will be reported as six-minute average percentage.
2. Special averaging times for emission limits: NOT APPLICABLE
3. Testing schedule. The proposed test schedule is September 18, 1996.
4. Plant personnel must fully document the process operations. Plant personnel must provide description and dates of last maintenance work performed on the process and control equipment prior to the compliance test.
5. One complete test report (one hard copy) shall be submitted to the MPCA within 45 days after the date on which the on-site testing was completed. The test report **must** be submitted to the agency regardless of the test results. Note that submittal of the report to the MPCA is the responsibility of the owner/operator and not of the testing firm.
6. A microfiche copy of the report shall be submitted to the MPCA within 105 days after the date on which the on-site testing was completed. The microfiche copy **must** be submitted to the agency regardless of the test results. Note that submittal of the microfiche copy to the MPCA is the responsibility of the owner/operator and not of the testing firm.
7. All submittals shall be addressed to:

   Supervisor, Compliance Determination Unit
   Compliance and Enforcement Section
   Air Quality Division
   Minnesota Pollution Control Agency
   520 Lafayette Road
   St. Paul, Minnesota 55155-4194

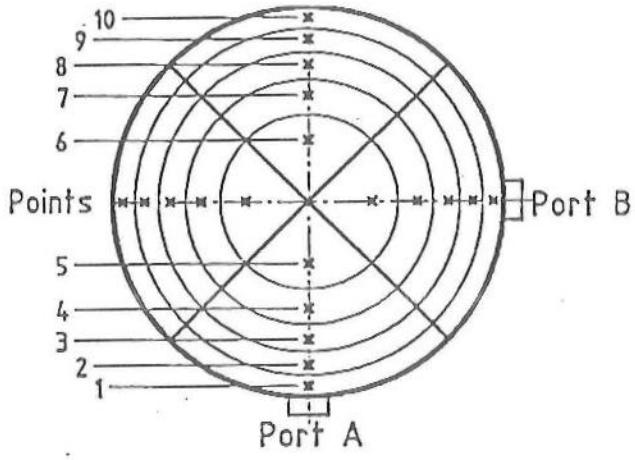
Figure 1. Site Description Form
MC/ES Metro Plant, Saint Paul, Minnesota
Incinerators #7 (Emission Point #3)

SAMPLING LOCATION DATA

Stack diameter, inches 29.0	Number of particulate test sampling points required by EPA Method 1 12
Length of straight, undisturbed flow;	Number of points actually used 20
Before ports, inches 259	Sampling point distribution;
After ports, inches 60	Number of ports 2
Before ports, stack diameters 8.9	Number of points per port 10
After ports, stack diameters 2.1	

SAMPLING POINT LOCATION WITHIN STACK CROSS-SECTION

Point Number	Percent of Traverse	Inches from Wall
1	2.6	1.0
2	8.2	2.4
3	14.6	4.2
4	22.6	6.6
5	34.2	9.9
6	65.8	19.1
7	77.4	22.4
8	85.4	24.8
9	91.8	26.6
10	97.4	28.0



SAMPLING SITE SCHEMATIC